# MAP NOTICES.

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THE ACTIVE INTEREST which has recently been awakened in forests and forestry has received another illustration in the issue by the Geological Survey of the State of a series of forest maps of New Jersey. The first of these represents the entire State upon a scale of five miles to an inch, showing, by shades of color, the proportion which the wooded areas bear to the total area.

The principal wooded area of New Jersey is in its southern, level part. South of latitude 40° 20′ these plains are almost solidly covered with forest, principally, if not entirely, of yellow pine. The secondary area is in the ridges and hills of the northern part of the State, especially near the boundary with New York. Here also the proportion of timber land runs very high.

Besides this map the Geological Survey has issued six sheets, upon a scale of one mile to an inch, showing in detail the wooded areas of the northern half of the State.

These maps accompany reports upon the woodland and forests of the State, by Mr. C. C. Vermeule, Gifford Pinchot, and others, constituting the greater part of the Annual Report of the Survey for the year 1899.

*The Transcontinental Triangulation and the American Arc of the Parallel. Special Publication No. 4, U. S. Coast and Geodetic Survey. Washington. Government Printing Office. 1900. Quarto, pp. 870. With Many Cuts and Other Illustrations and Two Maps.*

The measurement, by geodetic methods, of the arc of the parallel of 39° north latitude within the limits of the United States was commenced in 1872 and completed in 1898—a period of twenty-seven years. The eastern end of this arc is at Cape May, N. J., in longitude 74° 56′, and the western end at Point Arena, Cal., in longitude 123° 42′. The length of the arc is 2,625 miles, or, in longitude, 48° 46′. This is the longest arc of a meridian ever measured by any one Government, and its measurement is one of the most important, if not the most important, contribution to a knowledge of the shape and size of the earth which has ever been made. Moreover, this belt of triangulation provides no fewer than sixteen

States with a fundamental and reliable basis for the extension of topographic surveys.

In the course of this work ten base-lines have been measured and expanded, viz.: on Kent Island, Md., which is the most eastern; at St. Albans, in West Virginia; at Holton, Ind., Olney, Ills., and in the American Bottom in the same State, opposite St. Louis; at Versailles, Mo., Salina, Kan., Colorado Springs, Colo., Salt Lake, Utah, and the Yolo base in the Sacramento Valley of California.

Altogether 308 stations have been occupied in the triangulation. At 109 stations the latitude has been determined astronomically, at 73 stations azimuth has been determined, and at 37 stations longitude has been determined by the use of the telegraph.

The eastern portion of this belt passes mainly through a country of wooded hills and mountains—the Appalachians, which present many serious difficulties, though none of them were new to the men engaged upon the work. The central portion is through a region partially timbered—prairies, or barren plains—and here the difficulties were not great. Through both these sections the distances between stations are comparatively small, but in the western portion of the belt—that is, from the Rocky Mountain front in Colorado west to the Pacific coast—the conditions are quite different. The stations consist almost entirely of high mountains, ranging from 9,000 to 14,000 feet, and more, in altitude. The figures are large, the distances between stations being, on an average, fully 100 miles, and in one case—from Uncompahgre Peak, in the San Juan Mountains of Colorado, to Mount Ellen, in the Henry Mountains of Utah—the distance is approximately 180 miles.

The adjustment of the system has been made simply. After making the station adjustments, the figure forming the expansion about each base-line was adjusted by itself; then each belt of triangulation connecting one base expansion with the next was adjusted to itself and to the adjusted base expansions at its extremities.

It has been found, as a result of this measurement, that the form and dimensions of the 39th parallel within the United States do not conform either to the Clarke or the Bessel spheroid, but that it lies between the two. An interesting incident connected with the results is the fact that the difference in station error between Colorado Springs, at the east base of the Rocky Mountains, and Salt Lake City, at the west base of the Wasatch Mountains, is, upon the Clarke spheroid, not less than 46″, or nearly three-fourths of a mile. This difference is, of course, easily accounted for by the topographic surroundings of the two places.

Throughout the work differences of altitude were carefully measured by the method of zenith distances, and thus a continuous series of altitudes was carried across the continent.

During these twenty-seven years there has been expended upon the triangulation the sum of $500,000, in addition to the salaries of the men engaged upon it. The cost per linear mile of triangulation in such regions as Maryland and Delaware, which consist of partially timbered, rolling country, was $103; while in California, where the stations were upon high mountains and where large figures were employed, the cost was $463. Measured by the areas included, however, the result is quite different. Thus, in Indiana and Illinois, a partially timbered and rather level region, the cost was $11 per square mile; while in Colorado, where the stations were high and lines long, the cost was only about $2 per square mile. Measured by the cost per station occupied, the results again are different. In Indiana and Illinois the cost per station was $1,725; while in Colorado it was not less than $6,131.

In conclusion, mention should be made of the fact that the reductions of the geodetic work and the publication of the book have all been effected within the short space of two years from the completion of the field work—a most notable example of rapidity of execution and publication.